United States Patent and Trademark Office

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/649,370	08/28/2000	Nicholas Shaylor	SP-3695-US	8357

24209   7590   02/13/2004

GUNNISON MCKAY & HODGSON, LLP
1900 GARDEN ROAD
SUITE 220
MONTEREY, CA 93940

EXAMINER
ALI, SYED J

ART UNIT	PAPER NUMBER
2127	

DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *January 13, 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date *4-5*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Claims 1-8 are pending in this application. Claims 9-58 have been cancelled.

2.   Applicant's election without traverse of Group I (claims 1-8) in Paper No. 8 is

acknowledged.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chopra et al.

(USPN 6,167,423) (hereinafter Chopra) in view of Cutler et al. (USPN 5,057,996) (hereinafter

Cutler).

As per claim 1, Chopra discloses a data structure (col. 9 line 62 - col. 11 line 10, "The

connection manager 70 [Fig. 2] also provides constructs, herein called 'cliques,' with which the

connection manager externally manages concurrent execution of the worker threads")

comprising:

a pointer to a thread, wherein said thread is described by a first data structure (col. 16 line

46 - col. 17 line 14, "The owner thread 262 is a data structure that contains a reference to a

thread that is currently executing in the clique"); and

a message, wherein said message is described by a second data structure and said first

data structure comprises said second data structure (col. 16 line 46 - col. 17 line 14, "The

message queue 261 is a queue data structure for holding messages that arrive while the clique is

busy, and from which the messages are picked up for delivery by the thread that is executing

within the busy clique upon completing processing of the current message").

Cutler discloses the following limitations not shown by Chopra, specifically the thread

containing a thread control block (col. 7 lines 3-10, "A thread object 240 contains a thread

control block which stores the processor state as it executes the steps of a program, including the

pointers and values needed to keep track of all resources used by the thread object").

It would have been obvious to one of ordinary skill in the art to combine Chopra with

Cutler since the pointer to a thread disclosed by Chopra does not specifically deal with how the

thread is implemented. Chopra implements a dynamic allocation of worker threads to process

messages in a message queue, all of which is encapsulated within a "clique" object. This object

facilitates interprocess communication by defining the all the connections and shared resources

for a particular thread. However, since Chopra dynamically allocates worker threads to process

messages, the data structure that identifies the owner thread within the data structure comprises a

pointer to the thread object. Nonetheless, the thread object can be considered part of the clique

object, since it would still have access to all the private data members and methods of the clique

object. Thus, any implementation of a thread would be satisfactory to combine with Chopra.

Cutler discloses a thread object that includes references to all the data and methods needed to control execution of that thread, including a thread control block, which defines the instructions that the thread is to carry out. Thus, the combination of Chopra and Cutler provides a data structure that dynamically allocates a worker thread, while protecting the data and resources that thread operates on, and encapsulates all the interprocess communication data structures necessary within a single object.

As per claim 2, Cutler discloses the data structure of claim 1, wherein said first data structure is configured to store information used to control execution of a thread (col. 7 lines 11-24, "each thread object contains a thread control block 250 which points to the software process control block 252 for the thread's process").

It would have been obvious to one of ordinary skill in the art to combine Chopra with Cutler for reasons discussed above in reference to claim 1.

As per claim 3, Chopra discloses the data structure of claim 1, wherein said second data structure is configured to store a message (col. 16 line 46 - col. 17 line 14, "The message queue 261 is a queue data structure for holding messages that arrive while the clique is busy, and from which the messages are picked up for delivery by the thread that is executing within the busy clique upon completing processing of the current message", wherein the queue data structure is configured to hold a plurality of messages to be processed in a first-in-first-out manner).

As per claim 4, Cutler discloses the data structure of claim 1, wherein said first data structure further comprises:

a process control block pointer, wherein said process control block pointer points to a process control block (col. 7 lines 11-24, "each thread object contains a thread control block 250 which points to the software process control block 252 for the thread's process");

processor information (col. 7 lines 3-10, "A thread object 240 contains a thread control block which stores the processor state as it executes the steps of a program; and

stack information (col. 7 lines 3-10, "A thread object 240 contains a thread control block which stores the...pointers and values needed to keep track of all resources used by the thread object", wherein these resources include the stack allocated to the thread).

It would have been obvious to one of ordinary skill in the art to combine Chopra with Cutler for reasons discussed above in reference to claim 1.

As per claim 5, Cutler discloses the data structure of claim 4, wherein said process control block comprises:

memory information (Fig. 5, elements 170, 190, 200, and 254, wherein the disclosed container directories are the memory heaps allocated to each level of the process);

thread information (col. 7 lines 11-24, "each thread object contains a thread control block 250 which points to the software process control block 252 for the thread's process", wherein the data and values associated with the process control block control execution of the thread);

device driver information (Fig. 5, element 200, wherein the system level container identifies all the system resources, including device drivers); and

stack information (Fig. 5, elements 170, 190, and 200, wherein the directories allocated to each level of the thread are implemented as push-pop stacks).

It would have been obvious to one of ordinary skill in the art to combine Chopra with Cutler for reasons discussed above in reference to claim 1.

As per claim 6, Cutler discloses the data structure of claim 4, wherein said processor information comprises:

a processor identifier (col. 7 lines 3-24, ""A thread object 240 contains a thread control block which stores the processor state as it executes the steps of a program, including the pointers and values needed to keep track of all resources used by the thread object", wherein the state of the processor also identifies the processor being tracked); and

thread information (col. 7 lines 11-24, "each thread object contains a thread control block 250 which points to the software process control block 252 for the thread's process", wherein the data and values associated with the process control block control execution of the thread).

It would have been obvious to one of ordinary skill in the art to combine Chopra with Cutler for reasons discussed above in reference to claim 1.

As per claim 7, Chopra discloses .   The data structure of claim 1, wherein said second data structure further comprises:

control information (col. 10 lines 10-34, "a clique creates a sphere of control 150 that encompasses a state machine 152...all of whose connections 158-161 to other state machines outside the sphere of control are included in the clique", wherein the sphere of control identifies

where messages can be delivered and received and controls the concurrency of worker threads within the sphere of control).

As per claim 8, Chopra discloses the data structure of claim 7, wherein said second data structure further comprises:

data (col. 7 lines 35-43, "Messages in the illustrated connection manager are bit streams of data consisting of three attributes, variable length data, the size of the variable length data, and a message tag which describes the variable length data").

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.
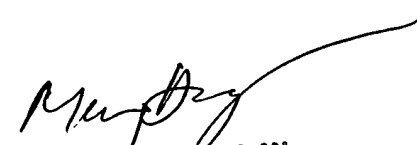
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Syed Ali

February 5, 2004

MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100